WHAT IS CLAIMED IS:

1. A color gamut compression apparatus for converting a source color generated by an information-input apparatus into a target color inside a color gamut reproducible by an information-output apparatus, comprising:

a point of convergence computation part for computing a point of convergence for a chromatic color such that the point of convergence has the same hue value as a hypothetical chromatic color that would be reproduced by the information-output apparatus based on a digital signal value for the information-input apparatus corresponding to a color determined by the source color, and lies inside the color gamut of the information-output apparatus;

a first point of compression computation part for computing a point of compression such that the point of compression lies on a substantially straight line connecting the point of convergence and the source color, and lies inside the color gamut of the information-output apparatus; and

a compression part for converting the source color into the target color corresponding to the point of compression computed by said first point of compression computation part.

2. The color gamut compression apparatus

according to claim 1, wherein said first point of compression computation part computes the point of compression such that the point of compression is at an intersection of the substantially straight line and a boundary of the color gamut of information-output apparatus.

3. The color gamut compression apparatus according to claim 1, further comprising:

a point of convergence computation execution determination part for determining whether the source is a chromatic color or an achromatic color;

a second point of compression computation part for computing, when said point of convergence computation execution determination part determines that the source color is an achromatic color, the point of compression such that the point of compression lies inside the color gamut of the information-output apparatus and has zero chroma; wherein

said compression part converts the source color into a color corresponding to the point of compression computed by said second point of compression computation part.

4. The color gamut compression apparatus according to claim 1, wherein, when a hue value of the source color matches that of any of a predetermined number of representative colors of

the information-input apparatus, said point of convergence computation part computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the matched representative color, lies inside the color gamut of the information-output apparatus and is achromatic; and wherein

when the source color is intermediate adjacent representative colors with respect to hue, the point of convergence is computed by linear interpolation of points of convergence corresponding to the adjacent representative colors.

5. The color gamut compression apparatus according to claim 1, wherein, when the hue of the source color lies within a hue range including transitions from the representative color Green to the representative colors Cyan, Blue and Magenta, said point of convergence computation part computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-output apparatus and is chromatic.

6. The color gamut compression apparatus according to claim 1, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Red to the representative color Yellow, said point of convergence computation part computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic.

7. The color gamut compression apparatus according to claim 1, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Magenta to the representative color Red, said point of convergence computation part computes a first point of convergence such that the first point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-output apparatus and is chromatic, and

said point of convergence computation part computes a second point of convergence such that the second point of convergence has the same

hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic; and wherein

the point of convergence is determined by linear interpolation on a hue scale on a line segment between the first point of convergence and the second point of convergence.

8. The color gamut compression apparatus according to claim 1, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Yellow to the representative color Green, said point of convergence computation part computes a first point of convergence such that the first point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-output apparatus and is chromatic, and

said point of convergence computation part computes a second point of convergence such that the second point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the

representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic; and wherein

the point of convergence is determined by linear interpolation on a hue scale on a line segment between the first point of convergence and the second point of convergence.

9. The color gamut compression apparatus according to claim 1, wherein said point of convergence computation part computes the point of convergence such that the point of convergence has the same brightness level as one of four values for the hue value which is determined by the source color, the four values being maximum chroma, mean value of the color gamut, gravitational center value of the color gamut and median of the color gamut.

10. The color gamut compression apparatus according to 9, wherein said point of convergence computation part computes the point of convergence such that the point of convergence has a hue value C_n satisfying an equation (1) below

$$C_n = K_C \times C_{max} \quad (1)$$

where C_{max} indicates one of maximum chroma reproducible by the information-output apparatus for the hue determined by the source color,

maximum chroma at the mean value of the color gamut, maximum chroma at the gravitational center value of the color gamut, and maximum chroma at the median of the color gamut, and k_c ($0<k_c<1$) indicates an arbitrary parameter.

11. The color gamut compression apparatus according to claim 1, wherein said point of convergence computation part computes an optional point of computation such that the optional point of convergence lies between two intersections formed by a line having the same hue value and same chroma as the point of convergence ~~determined according to claim 1~~ and parallel with a brightness axis and by a boundary of the color gamut of the information-output apparatus, and is determined in accordance with a chroma value of the source color.

12. The color gamut compression apparatus according to claim 11, wherein said point of compression computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 1~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 1~~, and is determined in accordance with a chroma value of the source color.

13. The color gamut compression apparatus according to claim 1, wherein said point of convergence computation part compares a chroma value of the source color with a predetermined chroma value a, and, if the chroma value is equal to or greater than a, the point of convergence ~~determined according to claim 1~~ is used, and, if the chroma value is smaller than a, said point of convergence computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 1~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 1~~, and is determined by the chroma value of the source color.

14. A color gamut compression method for converting a source color generated by an information-input apparatus into a target color inside a color gamut reproducible by an information-output apparatus, comprising the steps of:

computing a point of convergence for a chromatic color such that the point of convergence has the same hue value as a hypothetical chromatic color that would be reproduced by the information-output apparatus based on a digital signal value for the information-input apparatus corresponding

to a color determined by the source color, and lies inside the color gamut of the information-output apparatus;

computing a point of compression such that the point of compression lies on a substantially straight line connecting the point of convergence and the source color, and lies inside the color gamut of the information-output apparatus; and

converting the source color into the target color corresponding to the point of compression computed according to the step of computing the first point of compression.

15. The color gamut compression method according to claim 14, further comprising the steps of:

determining whether the source is a chromatic color or an achromatic color;

computing, when the source color is determined to be an achromatic color, the point of compression such that the point of compression lies inside the color gamut of the information-output apparatus and has zero chroma; wherein

the source color is converted into a color corresponding to the point of compression thus computed.

16. The color gamut compression method according to claim 14, wherein, when a hue value

of the source color matches that of any of a predetermined number of representative colors of the information-input apparatus, the step of computing the point of convergence computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the matched representative color, lies inside the color gamut of the information-output apparatus and is achromatic; and wherein

when the source color is intermediate adjacent representative colors with respect to hue, the point of convergence is computed by linear interpolation of points of convergence corresponding to the adjacent representative colors.

17. The color gamut compression method according to claim 14, wherein, when the hue of the source color lies within a hue range including transitions from the representative color Green to the representative colors Cyan, Blue and Magenta, the step of computing the point of convergence computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-

output apparatus and is chromatic.

18. The color gamut compression method according to claim 14, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Red to the representative color Yellow, the step of computing the point of convergence computes the point of convergence such that the point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic.

19. The color gamut compression method according to claim 14, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Magenta to the representative color Red, the step of computing the point of convergence computes a first point of convergence such that the first point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-output apparatus and is chromatic, and

the step of computing the point of convergence computes a second point of convergence

such that the second point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic; and wherein

the point of convergence is determined by linear interpolation on a hue scale on a line segment between the first point of convergence and the second point of convergence.

20. The color gamut compression method according to claim 14, wherein, when the hue of the source color lies within a hue range including a transition from the representative color Yellow to the representative color Green, the step of computing the point of convergence computes a first point of convergence such that the first point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a digital signal value corresponding to the representative color Blue, lies inside the color gamut of the information-output apparatus and is chromatic, and

the step of computing the point of convergence computes a second point of convergence such that the second point of convergence has the same hue value as a hypothetical color reproduced by the information-output apparatus based on a

digital signal value corresponding to the representative color Cyan, lies inside the color gamut of the information-output apparatus and is chromatic; and wherein

the point of convergence is determined by linear interpolation on a hue scale on a line segment between the first point of convergence and the second point of convergence.

21. A color gamut compression apparatus for converting a source color generated by an information-input apparatus into a target color inside a color gamut reproducible by an information-output apparatus, comprising:

a point of convergence computation part for computing a point of convergence for a chromatic color such that the point of convergence has the same hue value as the source color, has the same brightness as one of a maximum chroma color, a mean value of the color gamut reproducible by the information-output apparatus, gravitational center value of the color gamut reproducible by the information-output apparatus, and median of the color gamut reproducible by the information-output apparatus, and lies inside the color gamut of the information-output apparatus;

a first point of compression computation part for computing a point of compression such that the point of compression lies on a substantially straight line connecting the point

of convergence and the source color, and lies inside the color gamut of the information-output apparatus; and

a compression part for converting the source color into the target color corresponding to the point of compression computed by said first point of compression computation part.

22. The color gamut compression apparatus according to claim 21, wherein said first point of compression computation part computes the point of compression such that the point of compression is at an intersection of the substantially straight line and a boundary of the color gamut of information-output apparatus.

23. The color gamut compression apparatus according to claim 21, wherein, when a hue value of the source color matches that of any of a predetermined number of representative colors of the information-input apparatus, said point of convergence computation part computes the point of convergence for a chromatic color such that the point of convergence has the same hue value as the source color, has the same brightness as one of a maximum chroma color, a mean value of the color gamut reproducible by the information-output apparatus, gravitational center value of the color gamut reproducible by the information-output apparatus, and median of the color gamut

reproducible by the information-output apparatus, and lies inside the color gamut of the information-output apparatus; and wherein

when the source color is intermediate adjacent representative colors with respect to hue, the point of convergence is computed by linear interpolation of points of convergence corresponding to the adjacent representative colors.

24. The color gamut compression apparatus according to claim 21, further comprising:

a point of convergence computation execution determination part for determining whether the source is a chromatic color or an achromatic color;

a second point of compression computation part for computing, when said point of convergence computation execution determination part determines that the source color is an achromatic color, the point of compression such that the point of compression lies inside the color gamut of the information-output apparatus and has zero chroma; wherein

said compression part converts the source color into a color corresponding to the point of compression computed by said second point of compression computation part.

25. The color gamut compression apparatus according to 21, wherein said point of convergence computation part computes the point of convergence such that the point of convergence has a hue value C_n satisfying an equation (1) below

$$C_n = K_C \times C_{max} \quad (1)$$

where C_{max} indicates one of maximum chroma reproducible by the information-output apparatus for the hue value of the source color, maximum chroma at the mean value of the color gamut for the hue value of the source color, maximum chroma at the gravitational center value of the color gamut for the hue value of the source color, and maximum chroma at the median of the color gamut for the hue value of the source color, and k_c ($0<k_c<1$) indicates an arbitrary parameter.

26. The color gamut compression apparatus according to claim 21, wherein said point of convergence computation part computes an optional point of computation such that the optional point of convergence lies between two intersections formed by a line having the same hue value and same chroma as the point of convergence ~~determined according to claim 21~~ and parallel with a brightness axis and by a boundary of the color gamut of the information-output apparatus, and is determined in accordance with a chroma value of

the source color.

27. The color gamut compression apparatus according to claim 21, wherein said point of compression computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 21~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 1~~, and is determined in accordance with a chroma value of the source color.

28. The color gamut compression apparatus according to claim 21, wherein said point of convergence computation part compares a chroma value of the source color with a predetermined chroma value a, and, if the chroma value is equal to or greater than a, the point of convergence ~~determined according to claim 1~~ is used, and, if the chroma value is smaller than a, said point of convergence computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 1~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 1~~, and is determined by the chroma value of the source color.

29. A color gamut compression method for converting a source color generated by an information-input apparatus into a target color inside a color gamut reproducible by an information-output apparatus, comprising the steps of:

computing a point of convergence for a chromatic color such that the point of convergence has the same hue value as the source color, has the same brightness as one of a maximum chroma color, a mean value of the color gamut reproducible by the information-output apparatus, gravitational center value of the color gamut reproducible by the information-output apparatus, and median of the color gamut reproducible by the information-output apparatus, and lies inside the color gamut of the information-output apparatus;

computing a point of compression such that the point of compression lies on a substantially straight line connecting the point of convergence and the source color, and lies inside the color gamut of the information-output apparatus; and

converting the source color into the target color corresponding to the point of compression computed by said first point of compression computation part.

30. The color gamut compression method

according to claim 29, wherein the step of computing the first point of compression computes the point of compression such that the point of compression is at an intersection of the substantially straight line and a boundary of the color gamut of information-output apparatus.

31. The color gamut compression apparatus according to claim 29, wherein, when a hue value of the source color matches that of any of a predetermined number of representative colors of the information-input apparatus, the step of computing the point of convergence computes the point of convergence for a chromatic color such that the point of convergence has the same hue value as the source color, has the same brightness as one of a maximum chroma color, a mean value of the color gamut reproducible by the information-output apparatus, gravitational center value of the color gamut reproducible by the information-output apparatus, and median of the color gamut reproducible by the information-output apparatus, and lies inside the color gamut of the information-output apparatus; and wherein

when the source color is intermediate adjacent representative colors with respect to hue, the point of convergence is computed by linear interpolation of points of convergence corresponding to the adjacent representative colors.

32. The color gamut compression method according to claim 29, further comprising the steps of:

determining whether the source is a chromatic color or an achromatic color;

computing, when the source color is determined to be an achromatic color, the point of compression such that the point of compression lies inside the color gamut of the information-output apparatus and has zero chroma; wherein

the source color is converted into a color corresponding to the point of compression thus computed.

33. The color gamut compression apparatus according to 29, wherein the step of computing the point of convergence computes the point of convergence such that the point of convergence has a hue value C_n satisfying an equation (1) below

$$C_n = K_c \times C_{max} \quad (1)$$

where C_{max} indicates one of maximum chroma reproducible by the information-output apparatus for the hue value of the source color, maximum chroma at the mean value of the color gamut for the hue value of the source color, maximum chroma at the gravitational center value of the color

gamut for the hue value of the source color, and maximum chroma at the median of the color gamut for the hue value of the source color, and k_c ($0<k_c<1$) indicates an arbitrary parameter.

34. The color gamut compression apparatus according to claim 29, wherein the step of computing the point of convergence computes an optional point of computation such that the optional point of convergence lies between two intersections formed by a line having the same hue value and same chroma as the point of convergence ~~determined according to claim 29~~ and parallel with a brightness axis and by a boundary of the color gamut of the information-output apparatus, and is determined in accordance with a chroma value of the source color.

35. The color gamut compression apparatus according to claim 29, wherein said point of compression computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 29~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 29~~, and is determined in accordance with a chroma value of the source color.

36. The color gamut compression apparatus according to claim 29, wherein said point of convergence computation part compares a chroma value of the source color with a predetermined chroma value a, and, if the chroma value is equal to or greater than a, the point of convergence ~~determined according to claim 29~~ is used, and, if the chroma value is smaller than a, said point of convergence computation part computes an optional point of convergence such that the optional point of convergence lies between the point of convergence ~~determined according to claim 29~~ and an achromatic point having the same hue value and same brightness level as the point of convergence ~~determined according to claim 1~~, and is determined by the chroma value of the source color.